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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/776,427

02/11/2004

George M. Whitesides

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4054

7590

09/21/2005

Timothy J. Oyer, Ph.D.  
Wolf, Greenfield & Sacks, P.C.  
600 Atlantic Avenue  
Boston, MA 02210

EXAMINER

DICUS, TAMRA

ART UNIT

PAPER NUMBER

1774

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/776,427

**Applicant(s)**

WHITESIDES ET AL.

**Examiner**

Tamra L. Dicus

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-116 is/are pending in the application.
- 4a) Of the above claim(s) 1,2,16-54,68,76-116 and 602 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-15,55-59 and 69-75 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>07-15-05</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

Acknowledgement is made of the election of Group II, claims 3-15, 55-59, and 69-75 with traverse. Acknowledgement is made of the prior art in the related earlier applications.

#### ***Claim Objections***

1. Claim 13 is objected to because of the following informalities: "away from surface" in line 3 appears to be grammatically incorrect. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. As written, claim 13 comprises the language where the first and second molecular species terminates in an end facing away from the surface in a hydrophic/hydrophilic functionality, it is not clear which element has the hydrophobic or hydrophilic functionality (e.g. is it the first or second species or the surface of the substrate?).

#### ***Double Patenting***

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686

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F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 3-15, 55-59, and 69-75 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-32 of U.S. Patent No. 6518168 to Clem et al. in view of USPN 4,728,591 to Clark et al.

Although the conflicting claims are not identical, they are not patentable distinct from each other because the present claims differ only in the recitation of a first and second species terminating in an end facing away from a surface (see especially patented claims 17 and 28 of Clem).

Clark teaches a device comprising: an article defining a surface (col. 2, line 32, e.g. substrate surface); and an isolated region of a self-assembled monolayer of a first molecular species having a function (col. 2, lines 49-55, e.g. a functional material deposited through holes such as a protein molecules) surrounded by a second molecular species on the surface (col. 2, lines 40-49, e.g. two-dimensional self-assembled molecular array of protein molecules). The terminations of the second molecular species and the first being on and exposed away from the surface are defined by the pattern as shown in FIG. 3. See also Abstract, patented claims, and col. 8, lines 1-5 of Clark.

It would have been obvious to one having ordinary skill in the art to have modified the patterned self-assembled monolayer of Clem to have first and second material terminating at an

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end away from a surface as claimed because Clark teaches a patterned self-assembled monolayer that has this design shown in FIG. 3 with functional material as a conventional design pattern for patterning surfaces (Abstract, FIG. 3, patented claims, col. 2, lines 32-49, and col. 8, lines 1-5 of Clark).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 3-10, and 69-75 are rejected under 35 U.S.C. 102(b) as being anticipated by USPN 4,728,591 to Clark et al.

Clark teaches a device comprising: an article defining a surface (col. 2, line 32, e.g. substrate surface); and an isolated region of a self-assembled monolayer of a first molecular species having a function (col. 2, lines 49-55, e.g. a functional material deposited through holes such as a protein molecules) surrounded by a second molecular species on the surface (col. 2, lines 40-49, e.g. two-dimensional self-assembled molecular array of protein molecules). The isolated region in lateral dimension and area (encompassed by characteristic dimension) is between 1-50 nm (.01-.5 microns), meeting Applicant's range of less than about 10 microns, 5 microns, 1 micron, and 0.25 microns, less than 100 sq. microns, less than 25 microns, less than 1 sq. microns, and less than 0.06 microns, as the first material is surround by the pattern via the second molecular species, see col. 3, lines 56-59 and col. 4, lines 40-45. The terminations of the

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second molecular species and the first being on and exposed away from the surface are defined by the pattern as shown in FIG. 3. See also patented claims and col. 8, lines 1-5. Claims 3-10, and 69-75 are met.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,728,591 to Clark et al. and USPN 5,077,085 to Schnur et al.

Clark essentially teaches the claimed invention above, as applied to claim 1.

Regarding claims 11, and 14-15, Clark does not teach a nonplanar surface on the silicon substrate (col. 3, line 63).

Schnur teaches a patterned molecular assembly having a substrate that has a metal pattern or pattern via radiation on the surface of a substrate for self-assembled monolayers to alter reactivity or create spatially first and second areas of different reactivity in semiconductor microlithography (col. 6, lines 45-col. 7, line 6, Abstract, col. 7, lines 1-5, col. 7, line 65-col. 8, line 35, col. 8, line 46, and col. 9, lines 10-20 and 58-63).

It would have been obvious to one having ordinary skill in the art to have modified the silicone substrate of Clark to further provide a nonplanar surface because Schnur teaches a

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patterned molecular assembly having a silicon substrate that has a metal pattern or pattern via radiation on the surface of a substrate for self-assembled monolayers to alter reactivity or create spatially first and second areas of different reactivity in semiconductor microlithography (col. 6, lines 45-col. 7, line 6 of Schnur, Abstract, col. 7, lines 1-5, col. 7, line 65-col. 8, line 35, col. 8, line 46, and col. 9, lines 10-20 and 58-63). Thus, the claimed invention would produce the same invention and perform in the same way as Applicant as the same materials are provided by the prior art.

Regarding claims 12-13, Clark does not teach the surface of the silicon substrate having or in a hydrophilic and hydrophobic functionality (col. 3, line 63).

Schnur teaches a patterned molecular assembly having a substrate comprising silicon and palladium where the surface of a n-type silicon wafer has an hydrophilic and hydrophobic functionality because the surfaces are both hydrophilic and hydrophobic, where when contacted with water on the hydrophilic surface it spread to form a film thereon and when the surface was silanized the surface was hydrophobic by a technique to pattern the substrate and enable a monomolecular film to be chemisorbed onto the silicon substrate (Abstract, col. 11, lines 1-60, col. 7, lines 1-5, col. 7, line 65-col. 8, line 35, col. 8, line 46, and col. 9, lines 10-63).

It would have been obvious to one having ordinary skill in the art to have modified the silicone substrate of Clark to provide a hydrophilic and hydrophobic functionality as claimed because Schnur teaches the surfaces are both hydrophilic and hydrophobic, where when contacted with water on the hydrophilic surface it spread to form a film thereon and when the surface was silanized the surface was hydrophobic by a technique to pattern the substrate and enable a monomolecular film to be chemisorbed onto the silicon substrate (Abstract, col. 11,

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lines 1-60, col. 7, lines 1-5, col. 7, line 65-col. 8, line 35, col. 8, line 46, and col. 9, lines 10-63).

Thus, the claimed invention would produce the same invention and perform in the same way as

Applicant as the same materials are provided by the prior art.

Claims 55-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 4,728,591 to Clark et al. and USPN 5,077,085 to Schnur et al.

Regarding claims 55-59, Clark teaches a device comprising: an article defining a surface (col. 2, line 32, e.g. substrate surface); and an isolated region of a self-assembled monolayer of a first molecular species having a function (col. 2, lines 49-55, e.g. a functional material deposited through holes such as a protein molecules) surrounded by a second molecular species on the surface (col. 2, lines 40-49, e.g. two-dimensional self-assembled molecular array of protein molecules). The isolated region in lateral dimension and area (encompassed by characteristic dimension) is between 1-50 nm (.01-.5 microns), meeting Applicant's range of less than about 10 microns, 5 microns, 1 micron, and 0.25 microns, less than 100 sq. microns, less than 25 microns, less than 1 sq. microns, and less than 0.06 microns, as the first material is surround by the pattern via the second molecular species, see col. 3, lines 56-59 and col. 4, lines 40-45. The terminations of the second molecular species and the first being on and exposed away from the surface are defined by the pattern as shown in FIG. 3. See also patented claims and col. 2, lines 60-68, and col. 8, lines 1-5.

Further regarding claim 55, Clark does not teach a substrate comprising palladium.

Clark teaches a substrate of silicon (col. 3, line 63).



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Schnur teaches a patterned molecular assembly having a substrate comprising silicon and palladium (Abstract, col. 7, lines 1-5, col. 7, line 65-col. 8, line 35, col. 8, line 46, and col. 9, lines 10-20 and 58-63).

It would have been obvious to one having ordinary skill in the art to have included palladium to the substrate of Clark because Schnur teaches a substrate of silicon and of metals like palladium and the addition of palladium to a substrate, thereby teaching equivalence used in supporting patterned molecular assemblies (col. 7, lines 1-5, col. 7, line 65-col. 8, line 35, col. 8, line 46, and col. 9, lines 10-20 and 58-63 of Schnur. Thus, the claimed invention would produce the same invention and perform in the same way as Applicant as the same materials are provided by the prior art.

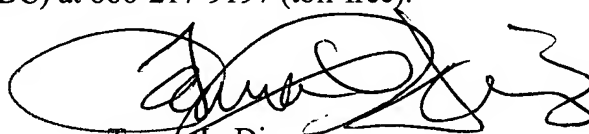
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tamra L. Dicus whose telephone number is 571-272-1519. The examiner can normally be reached on Monday-Friday, 7:00-4:30 p.m., alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on 571-272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Tamra L. Dicus  
Examiner  
Art Unit 1774

September 10, 2005



RENA DYE  
SUPERVISORY PATENT EXAMINER

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